CLAIMS

1. A method for converting boundary data into cell inner shape data, characterized by comprising:

a division step (A) of dividing external data (12) constituted of the boundary data of an object into cells (13) in an orthogonal grid;

a cutting point deciding step (B) of deciding an intersection point of the boundary data and a cell edge as a cell edge cutting point;

a boundary deciding step (C) of deciding a boundary formed by connecting the cell edge cutting points as the cell inner shape data;

a cell classification step (D) of classifying the divided cells into a nonboundary cell (13a) including no boundary surface and a boundary cell (13b) including a boundary surface; and

a boundary cell data classification step (E) of classifying cell data constituting the boundary cell into internal cell data inside the cell inner shape data and external cell data outside the cell inner shape data.

2. The method according to claim 1, characterized in that:

the cells are rectangular cells in two-dimensional representation, and

in the cutting point deciding step (B),

intersection points of boundary data and cell edges that have totally $2^4=16$ arrangement cases are decided as the cell edge cutting points, and the arrangement cases that become equivalence classes by rotational operation are decided as identical patterns so that the $2^4=16$ arrangement cases are further classified into 6 patterns.

3. The method according to claim 2, characterized in that:

in the boundary deciding step (C), a boundary line made by connecting the cell edge cutting points is decided as the cell inner shape data for all the 6 patterns.

4. The method according to claim 2, characterized in that:

in the boundary deciding step (C), cell inner shape data patterns that become equivalence classes by three-dimensional rotational operation are decided as identical patterns so that the cell inner shape data patterns are classified into 22 patterns.

5. The method according to claim 1, characterized in that:

the cells are rectangular parallelepiped cells, and

in the cutting point deciding step (B), intersection points of boundary data and cell edges that

have totally $2^{12}=4096$ arrangement cases are decided as the cell edge cutting points, and the arrangement cases that become equivalence classes by rotational operation and mirroring operation are decided as identical patterns so that the $2^{12}=4096$ arrangement cases are further classified into 144 patterns.

6. The method according to claim 5, characterized in that:

in the cutting point deciding step (B), the cell edge cutting point patterns that become equivalence classes by an inversion operation regarding presence/nonpresence of cutting points are decided as identical patterns so that the cell edge cutting point patterns are classified into 87 patterns in which the number of the cell edge cutting points is 0 to 6.

7. The method according to claim 5 or 6, characterized in that:

in the boundary deciding step (C), a boundary surface formed by connecting the cell edge cutting points is decided as the cell inner shape data for all the 144 patterns.

8. A program for converting boundary data into cell inner shape data, characterized by comprising:

a division step (A) of dividing external data (12)

constituted of boundary data of an object into cells (13) in an orthogonal grid;

a cutting point deciding step (B) of deciding an intersection point of the boundary data and a cell edge as a cell edge cutting point;

a boundary deciding step (C) of deciding a boundary connecting formed by the cell edge cutting points as the cell inner shape data;

a cell classification step (D) of classifying the divided cells into a nonboundary cell (13a) including no boundary surface and a boundary cell (13b) including a boundary surface; and

a boundary cell data classification step (E) of classifying cell data constituting the boundary cell into internal cell data inside the cell inner shape data and external cell data outside the cell inner shape data.